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ABSTRACT

A total of 240, 7- and 10-year-olds were tested on memory and sex-role preference tasks. The memory task was the Wickens release from proactive inhibition paradigm in which short-term recall of words is tested on successive trials. On trials 1-4 words were selected from 1 of 2 categories, either words with masculine or feminine connotations. On trial 5 words were drawn from the second category. Sex-role preferences were assessed by asking the child to select his favorite pictures from an array that included masculine and feminine items. Recall by boys at both ages increased following a shift between words with masculine or feminine connotations, suggesting that this dimension of a word's meaning was encoded in memory. Recall by girls who selected a feminine item as their favorite on the sex-role preference task increased following a category shift; recall by girls who chose a masculine item did not increase. These results were discussed in relation to previous research on the attributes of encoding in children's memory. (Author/CS)

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ENCODING PROCESSES AND SEX-ROLE PREFERENCES

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(e.g., queen, nylons, cow) connotations. While the masculine-feminine connotation of a word apparently was not a salient attribute of encoding for these adult subjects, it might be more important at other developmental levels. Indeed, research on the development of sex-role knowledge and preferences (Nadelman 1974) suggests that the masculine-feminine connotation of an object may be a particularly salient attribute in the encoding processes of young children. Furthermore, the degree to which the child is influenced by sex-role preferences might be related to his (her) encoding processes. That is, the child who shows a marked sex-role preference may encode along the masculine-feminine dimension to a greater extent than the child who is less extreme in his (her) sex-role preferences.

In the present experiment the role of the masculine-feminine connotation of a word as an attribute of encoding in children's memory was investigated. The stimuli were words describing games or activities appropriate either for boys or for girls. Seven- and 10-year-old boys and girls were assigned to control or experimental conditions for the release from PI task. In the control condition subjects were tested with either masculine or feminine pairs of words on all five trials. In the experimental condition subjects were tested with words from one category on trials 1 to 4 and with words from the other category on trial 5. Subjects in the experimental condition were tested subsequently on a sex-role preference task (from Nadelman 1974) to determine if an improvement in recall following a category shift was related to the child's sex-role preference.

Method

Subjects

The subjects were 240 children from grades 1-2 and grades 4-5 in a predominantly white school in a small Michigan town. Thirty boys and 30 girls at each age were assigned to the control condition and an equal number was assigned to the experimental condition, resulting in 8 groups of 30 subjects [age(2) x sex(2) x condition(2)]. The median age of the younger subjects was 7;7 yr. and of the older subjects, 10;9 yr.

Release from PI task

Stimuli. Ten pairs of words were used (see Table 1), 5 pairs of words with masculine connotations and 5 pairs of words with

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insert Table 1 here
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feminine connotations. Words were selected from a larger sample on the basis of data obtained in pretesting. In the pretest 14 seven-year-old boys and girls were asked to judge whether a boy or girl would play or do various games and activities. Words selected were those both boys and girls unanimously or near-unanimously agreed were appropriate for a child of one sex only. An effort was made to equate words in the two categories on the basis of length and acoustic properties, while minimizing associations within each pair.

Procedure. The instructions and stimulus materials were prerecorded and presented through headphones. On each trial, in the first five seconds a child was told to remember two words and repeated them aloud. A distraction task designed to prevent rehearsal of the words followed in which the child named colors

at the rate of one color per second for 15 seconds from an array presented by the experimenter. Then there was a ten second interval for the child to recall aloud the two words presented on that trial. The next trial started immediately after the recall interval.

The child was given one practice trial with words unrelated to the test words. Then there were five experimental trials. For approximately half the subjects in each control group the words on the five trials were masculine and for the other half the words were feminine. For subjects in the experimental groups the words were selected from one category (e.g., masculine) on trials 1 to 4, but from the other category (e.g., feminine) on trial 5. As many shifts were made from masculine to feminine pairs as from feminine to masculine pairs. The order of presentation of pairs was counterbalanced; every pair was presented on each trial with equal frequency.

Sex-role preference task

There were 40 pictures of various objects and activities drawn on 3 1/2 x 5 in. cards; 20 were masculine-stereotyped and 20 were feminine-sterotyped pictures. The experimenter arranged 8 cards in 2 rows in front of the child. Each row contained 2 masculine and 2 feminine items. The child selected the card he (she) liked the best, and the experimenter removed that card from the display. In like manner the child chose second, third, and fourth favorite cards. Then all remaining cards were picked up and a new set of 8 items was presented. There were five trials, using different stimuli on each trial. Finally, the child was shown the 5 items selected first on each trial, and he (she) chose the single item liked best.

General procedures

The testing session for each task lasted approximately 5 minutes. From 2 to 7 weeks after the administration of the memory task 118 of the 120 subjects in the experimental condition were given the sex-role preference task. All testing was conducted in isolated rooms within the school by one of three white experimenters during the months February-April 1974. An equal number of boys and girls in each condition was tested by male and female experimenters.

Results

Three aspects of the data are of particular interest: performance on the release from PI task, performance on the sex-role preference task, and the relationship between performance on these two tasks. Because preliminary analyses revealed no differences in the results from children tested by the different experimenters, data from all experimenters were combined.

Release from PI task

Scores for each trial ranged from 0 to 2. One point was given for each word recalled correctly, regardless of the order of recall. Recall data as a function of trials for boys and girls in the control and experimental groups are presented in

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insert Figures 1 and 2 here

Figure 1 for the 7-year-olds and in Figure 2 for the 11-year-olds. Older children recalled more words than younger children, $F(1, 232)=26.83$, $p<.001$, and performance declined over trials, $F(4, 928)=11.47$, $p<.001$. There was a significant condition x trials interaction, $F(4, 928)=3.00$, $p<.05$, reflecting the increased

recall of the experimental group on trial 5. For all control groups recall did not change from trials 4 to 5, $ts(29) \leq 1$. Performance improved on the shift trial for experimental groups of younger and older boys, and of 7-year-old girls, $ts(29) \geq 2.53$, $p < .03$. The recall of the 10-year-old girls improved following the category shift, but not significantly, $t(29) = 1.47$.

Sex-role preference task

The number of subjects choosing a masculine or feminine object as the most favorite item is presented in Table 2 with the

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insert Table 2 here

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mean number of masculine choices in the child's 5 and 20 most preferred items. Both younger and older boys typically chose a masculine object as their favorite, $\chi^2 s(1) \geq 27.2$, $p < .001$. There was some tendency for younger girls to choose a feminine object, $\chi^2(1) = 2.80$, $p < .10$, but older girls selected masculine and feminine items with approximately equal frequency, $\chi^2(1) < 1$.

Relationship between performance on memory and preference tasks

The data presented in Figures 1-2 and Table 2 suggest a related trend in the two tasks. For boys at both ages and the younger girls recall improved following a masculine-feminine shift, and there was a marked preference for objects of the appropriate sex on the sex-role preference task. Older girls failed to show an improvement in recall on the PI task, and were less extreme in their selection of feminine items on the sex-role preference task.

To examine these relationships further, performance on the PI task of girls selecting a masculine or feminine item as their favorite was compared.[2] These data are presented in Figure 3 with

data from appropriate control groups. For 7-year-old girls

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insert Figure 3 here

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who selected a masculine item, recall did not change between trials 4 and 5, $t(9)=1.08$, but increased for younger girls who selected a feminine item, $t(18)=3.62$, $p<.01$. At the 10-year-old level recall was stable between trials 4 and 5 for girls who selected a masculine item, $t<1$, but increased for girls who selected a feminine item, $t(12)=2.92$, $p<.02$. Thus girls with more sex-typed choices on the sex-role preference task were the only girls who showed evidence of encoding the masculine-feminine dimension in the release from PI task.

Discussion

That children as young as age 7 years may encode the masculine-feminine connotation of a word is consistent with previous findings of semantic encoding in young children (e.g., Hagen, Jongeward, & Kail 1975). Further, when recall increased following a shift between masculine and feminine items, performance returned to the level of performance on trial 1--a stronger effect than has been found with adults. Thus an attribute of a word's meaning may be especially salient in the encoding processes of children but less so with adults.

Encoding processes measured with the release from PI task seem to be related to the child's choice of items on the sex-role preference task. There was a striking correspondence between the strong increases in recall following a shift between words with masculine and feminine connotations and the extreme preference for sex-appropriate items by boys at both ages. The

picture was more complicated for girls, but again the memory and preference data were consistent. Individual differences in sex-typing of girls were detected in both tasks. Girls who selected more feminine items on the sex-role preference task also showed evidence of encoding the masculine-feminine connotation of a word; girls who did not prefer feminine items over masculine ones on the sex-role preference task did not appear to encode the words along a masculine-feminine dimension.

Thus the encoding of a word following a single auditory presentation of approximately one second may be influenced by some of the same factors that affect the child's longer-term social preferences. Future investigations of similar consistencies in performance across tasks will help to clarify the ways in which children process information.

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Footnotes

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2. Because only 1 boy selected a feminine item as his favorite on the sex-role preference task, these comparisons are restricted to the data from the girls.

TABLE 1

Word Pairs Used in the Experiment

Masculine pairs	Feminine pairs
hunting/airplane	cooking/hopscotch
wrestling/soldier	earrings/jumprope
fishing/car	sewing/house
pistol/football	dance/bracelet
darts/cowboy	purse/doll

TABLE 2

Selection of Masculine and Feminine Items on the Sex-Role Preference Task

	Favorite item	N	Mean number of masculine items selected in 5 most preferred	Mean number of masculine items selected in 20 most preferred
Boys				
7-year-olds	masculine	30	4.95	18.60
	feminine	0	----	-----
10-year-olds	masculine	29	5.00	18.60
	feminine	1	4.00	19.00
Girls				
7-year-olds	masculine	10	2.60	7.60
	feminine	19	0.25	3.00
10-year-olds	masculine	16	2.85	9.60
	feminine	13	0.70	5.60

Figure captions

Fig. 1--Percentage correct as a function of trials for 7-year-old boys and girls in the control and experimental groups.

Fig. 2--Percentage correct as a function of trials for 11-year-old boys and girls in the control and experimental groups.

Fig. 3--Percentage correct as a function of trials for 7- and 11-year-old girls in the experimental condition who selected masculine or feminine items as their favorites on the sex-role preference task, and girls in the control condition.

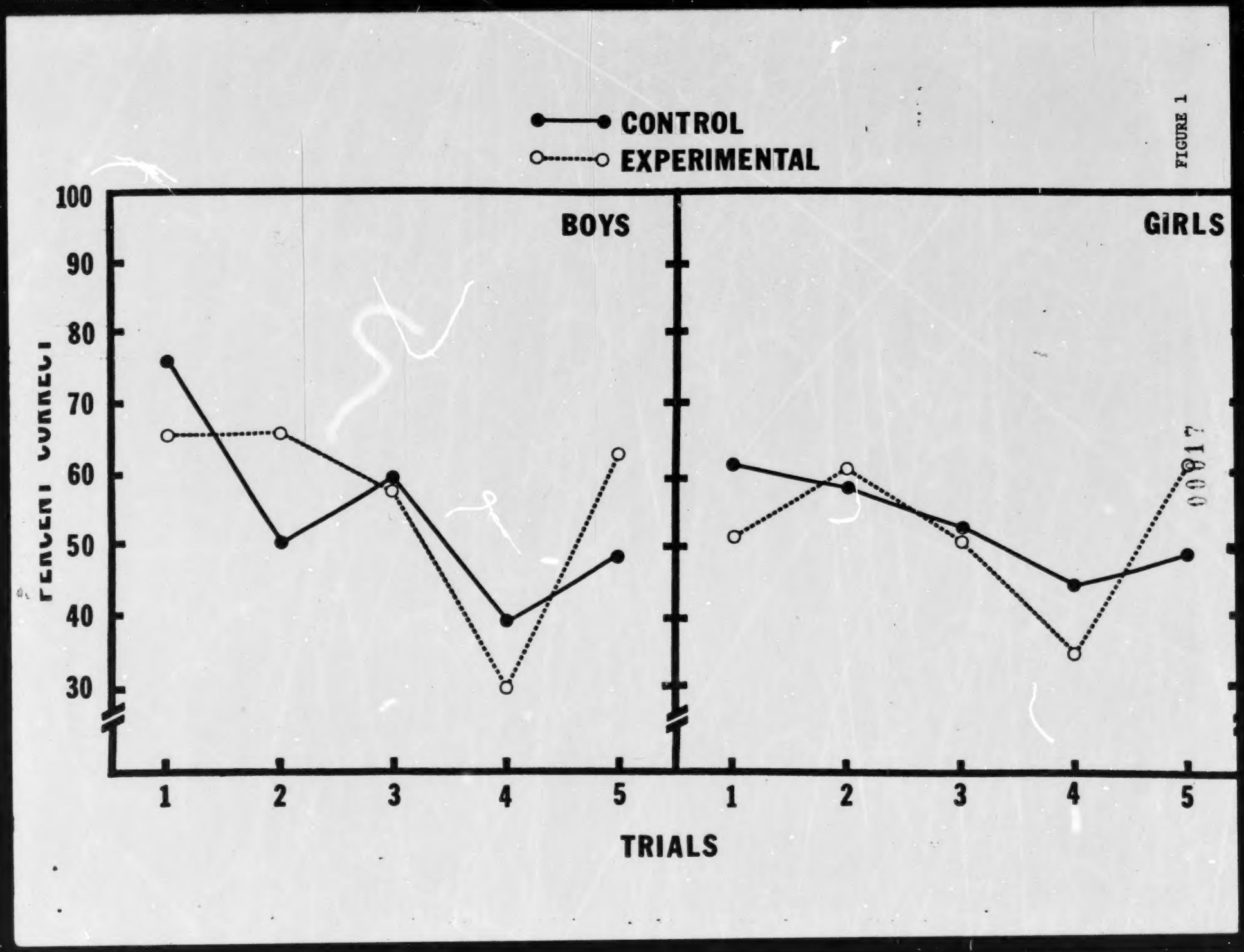

FIGURE 1

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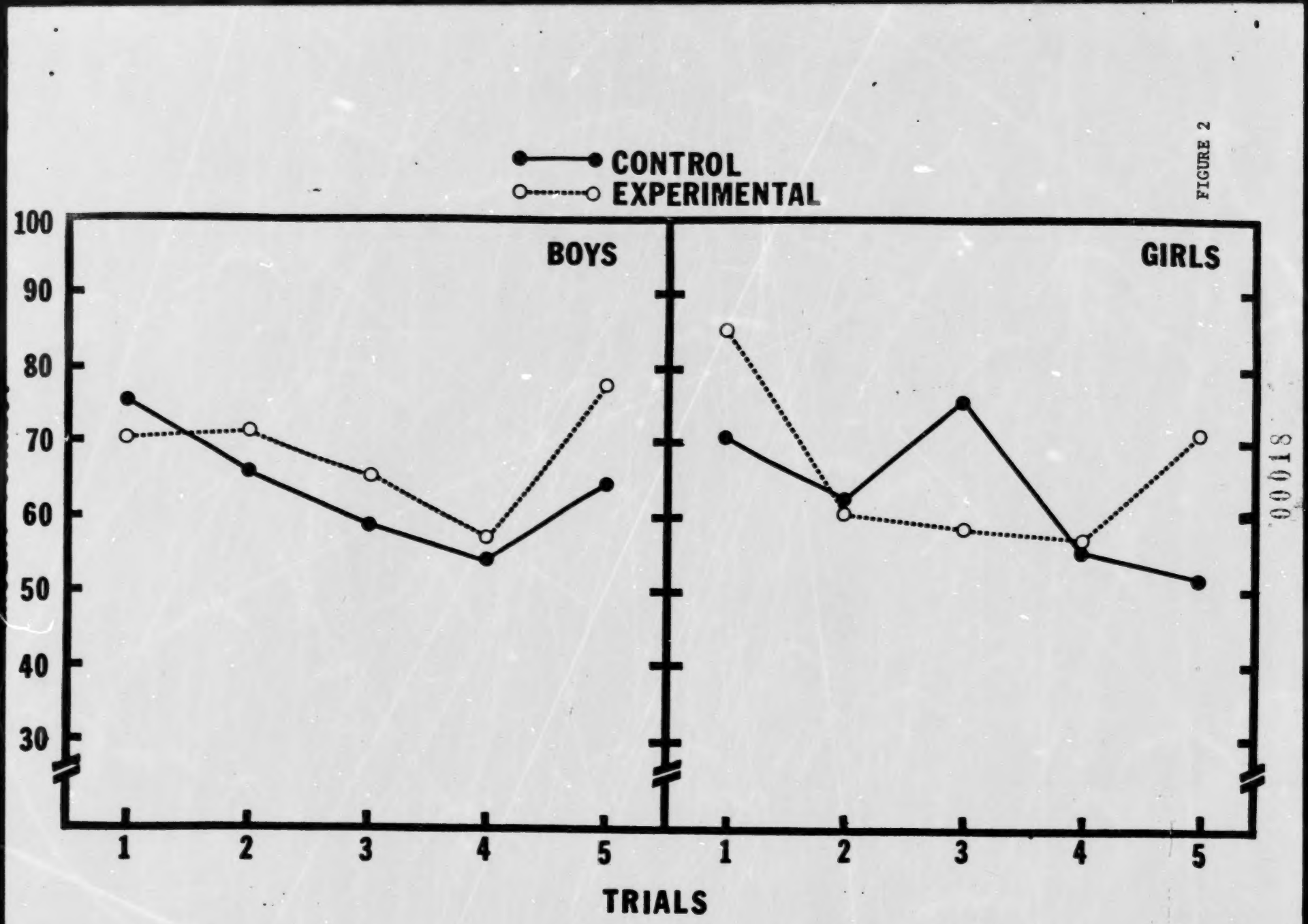

FIGURE 2

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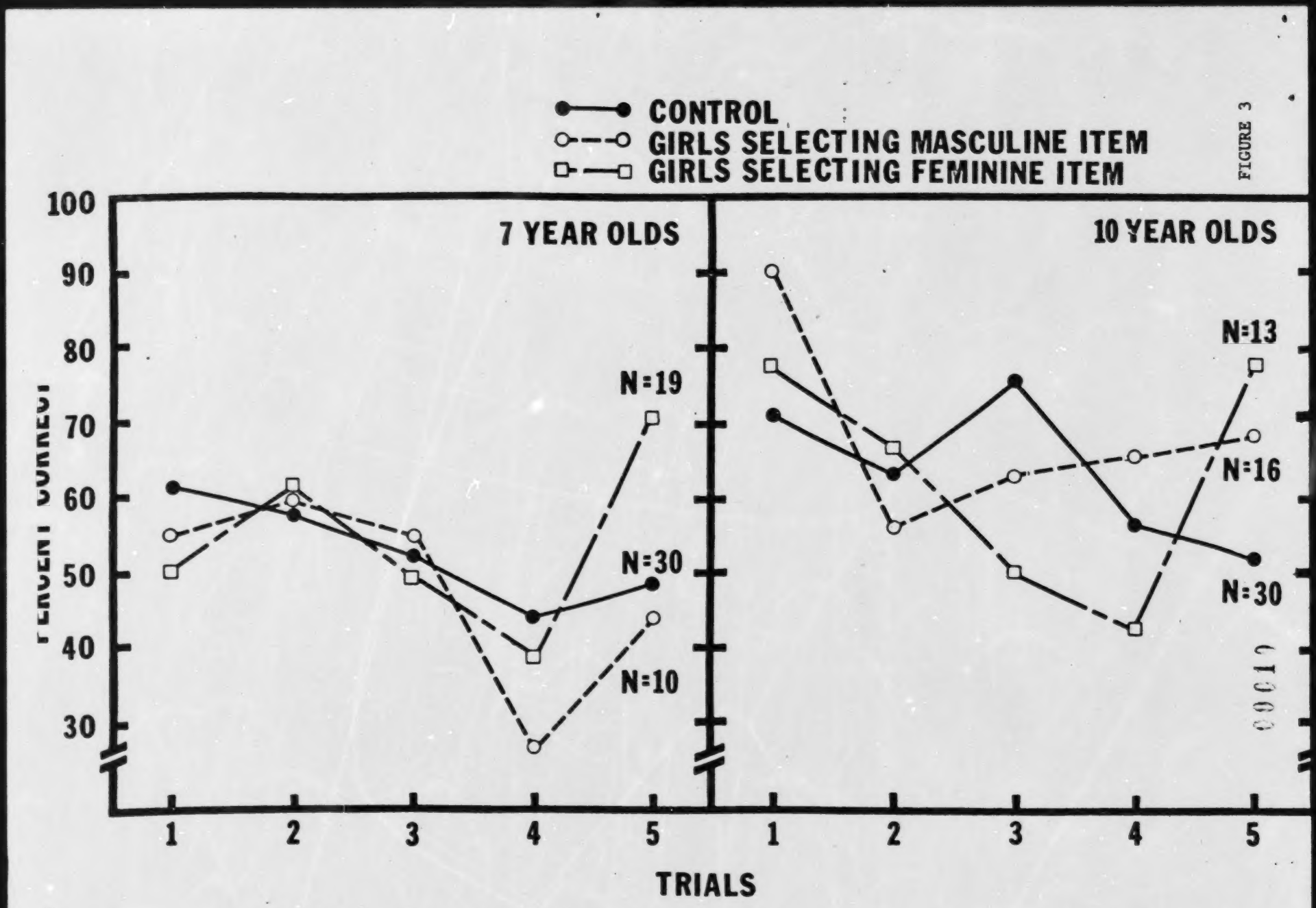
CONTROL
GIRLS SELECTING MASCULINE ITEM
GIRLS SELECTING FEMININE ITEM
7 YEAR OLDS
10 YEAR OLDS
N=19
N=30
N=10
N=13
N=16
N=30
100
90
80
70
60
50
40
30
1
2
3
4
5
TRIALS

FIGURE 3